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**PATENT**  
Attorney Docket No. 440431/PALL

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Appln. of:

LOVE et al.

Application No.: 09/763,597

Art Unit: 1723

Filed: July 2, 2001

Examiner: K. Menon

For: METHODS OF FORMING POROUS  
MEDIA

**PETITION TO WITHDRAW NOTICE OF ABANDONMENT  
PURSUANT TO 37 CFR § 1.181 OR, ALTERNATIVELY,  
TO REVIVE THE APPLICATION PURSUANT TO 37 CFR § 1.137(b)**

Commissioner for Patents  
U.S. Patent and Trademark Office  
Customer Service Window, Mail Stop Petition  
Randolph Building  
401 Dulany Street  
Alexandria, VA 22314

Dear Sir:

On September 27, 2005, a Notice of Abandonment (Attachment A) was mailed for this application. According to the Notice of Abandonment, no proper reply was timely filed in response to an October 1, 2004, Office Action (Attachment B). As explained in the petition, a proper reply to the Office Action was timely filed on April 1, 2005.

Pursuant to 37 CFR § 1.181, applicant petitions for withdrawal of the Notice of Abandonment dated September 27, 2005. If any fee is associated with this petition, it is respectfully requested (a) that the fee be waived because the Notice of Abandonment was issued in error on the part of the United States Patent and Trademark Office or (b) that the fee be charged to Deposit Account No. 12-1216. (A duplicate copy of this petition is attached.)

Alternatively, if it is determined that the Notice of Abandonment was properly issued, applicant petitions pursuant to 37 CFR § 1.137(b) to revive the application because it was unintentionally abandoned. A reply to the October 1, 2004, Office Action accompanies this petition. It is stated that the entire delay in filing the required reply from the due date for the reply until the filing of a grantable petition pursuant to this paragraph was unintentional. If the

application is revived pursuant to 37 CFR § 1.137(b), it is respectfully requested that the \$1,500 37 CFR § 1.17(m) fee be charged to Deposit Account No. 12-1216.

#### Statement of Facts Involved

1. An Office Action for this application was mailed on October 1, 2004.
2. On April 1, 2005, a timely reply to the Office Action was mailed to the Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia, 22313-1450. The reply was entitled Response to Office Action (Attachment C) and included a Certificate of Mailing certifying that the Response was properly mailed on April 1, 2005.
3. As mailed, the Response incorrectly identified the application number as 09/793,597. The correct application number is 09/763,597. However, all other identifying information, including the first named inventor, the title of the application, the filing date, the art unit, and the Examiner, i.e., Examiner K. Menon, was correct.
4. After April 1, 2005, Examiner Menon called applicant's attorney and asked if a response to the October 1, 2004, Office Action had been filed. Applicant's attorney stated that a Response to Office Action was mailed to the Commissioner for Patents on April 1, 2005, with a Certificate of Mailing.
5. On August 10, 2005, applicant's attorney faxed to Examiner Menon a copy of the Response to Office Action with the correct application number identified (Attachment D). This copy was faxed to telephone numbers (571) 273-8300 and (571) 273-1143, as shown at the top of the facsimile machine printout of the Facsimile Cover Sheet (Attachment E).
6. The Notice of Abandonment was mailed on September 27, 2005.

#### Points to be Considered

1. A timely reply to the October 1 2004, Office Action was mailed to the Commissioner for Patents when the Response to Office Action was mailed on April 1, 2005. The Certificate of Mailing certifies that the Response was timely mailed. Although the application number was incorrectly identified in the Response, all of the other identifying information was correct, including the art unit and the name of the Examiner. This should have been sufficient information to direct the Response to the proper file. Because the Response was timely filed, as evidenced by the Certificate of Mailing, with sufficient identifying information, the Notice of Abandonment should be withdrawn.
2. According to 37 CFR § 1.5, if correspondence does not include the correct application number, the correspondence should be returned. The returned correspondence should be

In re Appln. of: LOVE et al.  
Application No.: 09/763, 597

accompanied by a cover letter indicating that if the correspondence is sent again within two weeks with the correct application number, the correspondence will be granted the original date of receipt. Applicant's attorney did not receive such a cover letter, although he did fax the Examiner a copy of the Response to Office Action with the correct application number on August 10, 2005. Because the Examiner received a corrected version of the Response to Office Action, the Response to Office Action should be considered timely filed and the Notice of Abandonment should be withdrawn.

#### Actions Requested

It is respectfully requested:

- 1) that the Response to Office Action mailed on April 1, 2005, the corrected Response to Office Action faxed on August 10, 2005, and the Notice of Abandonment be reviewed and
- 2) that either:
  - i) the Notice of Abandonment be withdrawn or
  - ii) if the Notice of Abandonment is not withdrawn, the application be revived pursuant to 37 CFR § 1.137(b).

Respectfully submitted,



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John M. Belz, Reg. No. 30,359  
LEYDIG, VOIT & MAYER  
700 Thirteenth Street, N.W., Suite 300  
Washington, DC 20005-3960  
(202) 737-6770 (telephone)  
(202) 737-6776 (facsimile)

Date:

19 Oct 2005

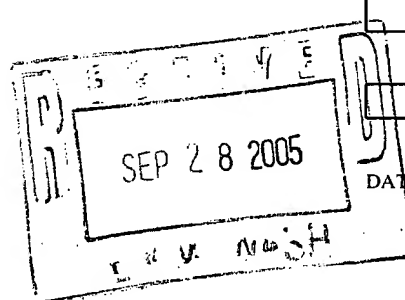


# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/763,597	07/02/2001	Charles Love	440431	9284

23548 7590 09/27/2005  
LEYDIG VOIT & MAYER, LTD  
700 THIRTEENTH ST. NW  
SUITE 300  
WASHINGTON, DC 20005-3960



EXAMINER	
MENON, KRISHNAN S	
ART UNIT	PAPER NUMBER

1723

DATE MAILED: 09/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Notice of Abandonment

Application No.

09/763,597

Examiner

Krishnan S. Menon

Applicant(s)

LOVE ET AL.

Art Unit

1723

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

This application is abandoned in view of:

1. ☒ Applicant's failure to timely file a proper reply to the Office letter mailed on 01 October 2004.
  - (a) ☐ A reply was received on \_\_\_\_\_ (with a Certificate of Mailing or Transmission dated \_\_\_\_\_), which is after the expiration of the period for reply (including a total extension of time of \_\_\_\_\_ month(s)) which expired on \_\_\_\_\_.
  - (b) ☐ A proposed reply was received on \_\_\_\_\_, but it does not constitute a proper reply under 37 CFR 1.113 (a) to the final rejection. (A proper reply under 37 CFR 1.113 to a final rejection consists only of: (1) a timely filed amendment which places the application in condition for allowance; (2) a timely filed Notice of Appeal (with appeal fee); or (3) a timely filed Request for Continued Examination (RCE) in compliance with 37 CFR 1.114).
  - (c) ☒ A reply was received on 8/10/05 but it does not constitute a proper reply, or a bona fide attempt at a proper reply, to the non-final rejection. See 37 CFR 1.85(a) and 1.111. (See explanation in box 7 below).
  - (d) ☐ No reply has been received.
2. ☐ Applicant's failure to timely pay the required issue fee and publication fee, if applicable, within the statutory period of three months from the mailing date of the Notice of Allowance (PTOL-85).
  - (a) ☐ The issue fee and publication fee, if applicable, was received on \_\_\_\_\_ (with a Certificate of Mailing or Transmission dated \_\_\_\_\_), which is after the expiration of the statutory period for payment of the issue fee (and publication fee) set in the Notice of Allowance (PTOL-85).
  - (b) ☐ The submitted fee of \$\_\_\_\_\_ is insufficient. A balance of \$\_\_\_\_\_ is due.  
The issue fee required by 37 CFR 1.18 is \$\_\_\_\_\_. The publication fee, if required by 37 CFR 1.18(d), is \$\_\_\_\_\_.
  - (c) ☐ The issue fee and publication fee, if applicable, has not been received.
3. ☐ Applicant's failure to timely file corrected drawings as required by, and within the three-month period set in, the Notice of Allowability (PTO-37).
  - (a) ☐ Proposed corrected drawings were received on \_\_\_\_\_ (with a Certificate of Mailing or Transmission dated \_\_\_\_\_), which is after the expiration of the period for reply.
  - (b) ☐ No corrected drawings have been received.
4. ☐ The letter of express abandonment which is signed by the attorney or agent of record, the assignee of the entire interest, or all of the applicants.
5. ☐ The letter of express abandonment which is signed by an attorney or agent (acting in a representative capacity under 37 CFR 1.34(a)) upon the filing of a continuing application.
6. ☐ The decision by the Board of Patent Appeals and Interference rendered on \_\_\_\_\_ and because the period for seeking court review of the decision has expired and there are no allowed claims.
7. ☒ The reason(s) below:  
  
please see the attachment

  
W. L. WALKER  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700

Petitions to revive under 37 CFR 1.137(a) or (b), or requests to withdraw the holding of abandonment under 37 CFR 1.181, should be promptly filed to minimize any negative effects on patent term.

Art Unit: 1723

Attachment to PTOL 1432: Notice of Abandonment

Applicant's response dated 8/10/04 to the outstanding office action of 10/1/04 with corrected application number was not filed timely, since the six-month statutory time expired had expired on 4/1/04.

The application was therefore constructively abandoned.

The response filed on 4/1/04 with three-month extension fee had the wrong application number on it, which may have resulted in that response being filed in the application with the corresponding application number. The failure to give the correct application number creates difficulty in matching incoming papers with the application file to which they pertain. This applies especially to amendments, powers of attorney, changes of address, status letters, petitions for extension of time, and other petitions. Please see MPEP 502.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krishnan S. Menon whose telephone number is 571-272-1143. The examiner can normally be reached on 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda L. Walker can be reached on 571-272-1151. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1723

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read "KS Menon", written in a cursive style.

Krishnan S. Menon  
Patent Examiner  
9/12/05



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/763,597	07/02/2001	Charles Love	440431	9284
23548	7590	10/01/2004		
LEYDIG VOIT & MAYER, LTD 700 THIRTEENTH ST. NW SUITE 300 WASHINGTON, DC 20005-3960			EXAMINER MENON, KRISHNAN S	
			ART UNIT 1723	PAPER NUMBER

- 5 2004

DATE MAILED: 10/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

RECEIVED



<p align="center"><b>Office Action Summary</b></p>	<p>Application No.</p> <p align="center">09/763,597</p>	<p>Applicant(s)</p> <p align="center">LOVE ET AL.</p>	
	<p>Examiner</p> <p align="center">Krishnan S Menon</p>	<p>Art Unit</p> <p align="center">1723</p>	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10 September 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 and 14-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 14-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takahar et al (US 5,147,917) in view of Ohta et al (US 5,198,167).

Claim 1: Takahar teaches a method of forming a porous medium comprising applying pressure to the medium precursor including inorganic particles and then sinter bonding the particles together to form the porous medium having porosity 50% or more (abstract; examples).

Takahar does not teach applying pressure to a first portion and applying pressure separately to a second portion in the molding process. Ohta teaches applying pressure to a first portion and separately applying pressure to a second portion in a molding process as claimed in col 13 line 56 – col 14 line 27. It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of Ohta in the teaching of Takahar for the molding process because Takahar does not teach the specifics of the molding process and suggests optimizing the molding process to suit the needs (see col 3 lines 45-62), and to obtain uniformity and desired fiber/particle orientation as taught by Ohta.

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Claims 14-16: first die and second die are taught by Ohta, and they impart predetermined characteristics to respective portions – see the referenced paragraphs. Same compression ratios and same particle density are also obtained: referenced paragraphs; and also optimization as suggested by Takahar in examples.

### ***Response to Arguments***

Applicant's arguments with respect to claim 1 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***


This action is in response to an RCE and is made non-final because of the new grounds for rejection introduced because of the newly added claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krishnan S Menon whose telephone number is 571-272-1143. The examiner can normally be reached on 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda L Walker can be reached on 571-272-1151. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Krishnan Menon  
Patent Examiner

  
W. L. WALKER  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700

**Notice of References Cited**

Application/Control No.

09/763,597

Applicant(s)/Patent Under  
Reexamination  
LOVE ET AL.

Examiner

Krishnan S Menon

Art Unit

1723

Page 1 of 1

**U.S. PATENT DOCUMENTS**

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
	A	US-5,198,167	03-1993	Ohta et al.	264/86
	B	US-			
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

**FOREIGN PATENT DOCUMENTS**

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

**NON-PATENT DOCUMENTS**

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

\*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)  
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

In re Application of: Charles LOVE  
 Application No. 09/793,597  
 Filed: July 2, 2001  
 For: METHODS OF FORMING POROUS MEDIA

U.S. Patent and Trademark Office  
 Randolph Building  
 401 Dulany Street, Customer Window, Mail Stop Amendment  
 Alexandria, VA 22314

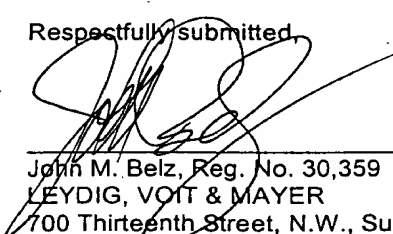
Sir:

- ☐ Small entity status is claimed for this application under 37 CFR 1.27.
- ☒ Petition for an extension of time for the period noted below, as well as for any additional period necessary to render the present submission timely. Please charge Deposit Account No. 12-1216 for the appropriate petition fee.
- ☐ Other:
- ☒ Please charge Deposit Account No. 12-1216 in the total amount indicated below. A duplicate copy of this transmittal sheet is enclosed herewith.

					SMALL ENTITY		OTHER THAN A SMALL ENTITY	
TIME EXTENSION PETITION FEE		three-month			\$ 0.00		\$1,020.00	
	subtract time extension fee previously paid	none			(\$ 0.00)		(\$ 0.00)	
CLAIM FEE	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	EXTRA CLAIMS PRESENT	RATE	ADDIT. CLAIM FEE	RATE	ADDIT. CLAIM FEE
TOTAL		MINUS		=0	x 25=	\$	x 50=	\$
INDEPENDENT		MINUS		=0	x 100=	\$	x 200=	\$
<input type="checkbox"/>	FIRST PRESENTATION OF MULTIPLE CLAIM				+ 180=	\$	+ 360=	\$
<b>TOTAL AMOUNT TO BE CHARGED TO DEPOSIT ACCOUNT</b>					<b>TOTAL</b>	<b>\$</b>	<b>TOTAL</b>	<b>\$1,020</b>

- ☒ The Commissioner is hereby authorized to charge any deficiencies in the following fees associated with this communication or credit any overpayment to Deposit Account No. 12-1216.
- ☒ Any filing fees under 37 CFR 1.16 for the presentation of extra claims.
- ☒ Any patent application processing fees under 37 CFR 1.17.

Respectfully submitted,

  
 John M. Belz, Reg. No. 30,359  
 LEYDIG, VOIT & MAYER  
 700 Thirteenth Street, N.W., Suite 300  
 Washington, DC 20005-3960  
 (202) 737-6770 (telephone)  
 (202) 737-6776 (facsimile)

Date: 1 April 2005  
 JMB:ves

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of:

Charles LOVE

Application No. 09/793,597

Art Unit: 1723

Examiner: K. Menon

Filed: July 2, 2001

For: METHODS OF FORMING POROUS  
MEDIA

**RESPONSE TO OFFICE ACTION**

U.S. Patent and Trademark Office  
Randolph Building  
401 Dulany Street, Customer Window, Mail Stop Amendment  
Alexandria, VA 22314

Dear Sir:

In response to the Office Action dated October 1, 2004, Applicant petitions for a three-month extension of time, submits the requisite fee therefor, and requests that the referenced patent application be amended as shown below.

In re Appln. of Charles LOVE  
Application No. 09/793,597

*TITLE AMENDMENTS*

Replace the title with:

~~POROUS STRUCTURES AND METHODS AND APPARATUS FOR~~ OF FORMING  
~~POROUS STRUCTURES~~ MEDIA



### *SPECIFICATION AMENDMENTS*

Delete the current "Summary of the Invention" section of the application including the text beginning "Summary of the Invention" on page 3 and ending "...having any desired shape." on page 6 and substitute the following replacement section:

#### *Summary of the Invention*

In accordance with one aspect of the invention, a method of forming a porous medium may comprise applying pressure to a first portion of a medium precursor including inorganic particles and separately applying pressure to a second portion of the medium precursor. The first portion and the second portion of the medium precursor are pressed along a common axis. The method further comprises sinter bonding the inorganic particles together to form a porous medium having a porosity of about 50% or more.

In accordance with another aspect of the invention, a method of forming a porous medium may comprise depositing a medium precursor including inorganic particles into a mold cavity. The method also comprises moving a first die against a first portion of the medium precursor in the mold cavity and moving a second die against a second portion of the medium precursor in the mold cavity. The first and second dies are moved along a common axis. The method further comprises sinter bonding the inorganic particles together to form a porous medium having a porosity of about 50% or more.

In accordance with another aspect of the invention, a method of forming a porous medium may comprise depositing a medium precursor including inorganic particles into a mold cavity. The method also comprises displacing a first die and a second die along a common axis against first and second portions, respectively, of the medium precursor in the mold cavity. The method further comprises terminating the axial displacement of the first and second dies. The medium precursor remains in the mold cavity until after the axial displacement of the first and second dies is terminated. The method further comprises sinter bonding the inorganic particles together to form a porous medium having a porosity of about 50% or more.

Methods according to various aspects of the invention can produce a high-quality filter medium having any desired shape. By separately pressing individual portions of the medium precursor, the compression of each individual portion of the filter medium precursor can be maximized or tailored to predetermined specifications.

*CLAIM AMENDMENTS*

1. (Currently Amended) A method of forming a porous medium comprising:  
applying pressure to a first portion of a medium precursor including inorganic particles;

separately applying pressure to a second portion of the medium precursor, wherein the first portion and the second portion of the medium precursor are pressed along a common axis; and

sinter bonding the inorganic particles together to form a porous medium having a porosity of about 50% or more.

Claims 2-13 (Cancelled)

14. (Previously Presented) The method of claim 1 further comprising depositing the medium precursor as a slurry into a mold cavity, wherein applying pressure to a first portion of the medium precursor includes pressing a first die against a first portion of the slurry in the mold cavity, and wherein separately applying pressure to a second portion of the medium precursor includes pressing a second die against a second portion of the slurry in the mold cavity, the first and second dies respectively imparting predetermined characteristics to respective portions of the porous medium.

15. (Previously Presented) The method of claim 14 wherein the first and second dies press the first and second portions at the same compression ratio.

16. (Previously Presented) The method of claim 14 wherein the first and second dies press the first and second portions to substantially the same particle density.

17. (New) The method of claim 1 wherein pressure is applied to the second portion of the medium precursor during the application of pressure to the first portion of the medium precursor.

18. (New) The method of claim 17 further comprising terminating the application of pressure to the first and second portions of the medium precursor at the same time.

19. (New) The method of claim 1 further comprising terminating the application of pressure to the first and second portions of the medium precursor at the same time.

20. (New) The method of claim 1 further comprising depositing the medium precursor in a mold cavity before applying pressure to the first and second portions of the medium precursor, wherein the medium precursor remains in the mold cavity until after the application of pressure to the first and second portions of the medium precursor.

21. (New) A method of forming a porous medium comprising:  
depositing a medium precursor including inorganic particles into a mold cavity;  
moving a first die against a first portion of the medium precursor in the mold cavity and moving a second die against a second portion of the medium precursor in the mold cavity including moving the first and second dies along a common axis; and  
sinter bonding the inorganic particles together to form a porous medium having a porosity of about 50% or more.

22. (New) The method of claim 21 wherein the first and second dies move along the common axis in the same direction.

23. (New) The method of claim 21 wherein the first and second dies move along the common axis in opposite directions.

24. (New) The method of claim 21 wherein the second die moves during movement of the first die.

25. (New) The method of claim 21 wherein the second die moves after movement of the first die.

26. (New) The method of claim 21 wherein the first and second dies stop moving at the same time.

27. (New) The method of claim 21 wherein the medium precursor remains in the mold cavity until after the first and second dies have moved axially.

28. (New) A method of forming a porous medium comprising:  
depositing a medium precursor including inorganic particles into a mold cavity;

displacing a first die and displacing a second die along a common axis against first and second portions, respectively, of the medium precursor in the mold cavity;

terminating the axial displacement of the first and second dies, wherein the medium precursor remains in the mold cavity until after the termination of the axial displacement of the first and second dies; and

sinter bonding the inorganic particles together to form a porous medium having a porosity of about 50% or more.

29. (New) The method of claim 28 wherein displacing the first and second dies includes axially displacing the first and second dies in the same direction or in opposite directions.

30. (New) The method of claim 29 wherein terminating the axial displacement of the first and second dies includes terminating the axial displacement of the first and second dies at the same time.

31. (New) The method of claim 29 wherein displacing the first and second dies includes moving the second die while the first die is moving.

*REMARKS*

Pending claims 1 and 14-16 were rejected under 35 USC §103(a) as being unpatentable over Takahar in view of Ohta. This rejection is respectfully traversed.

The combination of Takahar and Ohta is improper. Takahar discloses a method for the preparation of open cell porous metallic material, which is applied to filters. The object of Takahar is to provide a method for obtaining an open cell metallic material of a small pore size, uniformly distributed micropores, and high porosity.

According to the Office Action, Takahar does not teach applying pressure to a first portion and separately applying pressure to a second portion in a molding process, but Ohta does. However, the only reason Ohta teaches applying primary and secondary pressing forces is to properly orient reinforcing fibers, up to 40% volume fraction, in a fiber-reinforced composite material. Yet there are no reinforcing fibers in the open cell metallic material of Takahar. Further, one of ordinary skill in the art could not include the reinforcing fibers of Ohta in the fine pore, high porosity, porous metallic material of Takahar because the reinforcing fibers would increase the size of the pores and disrupt the distribution of the micropores, contrary to the stated object of Takahar.

One of ordinary skill in the art reading Takahar would never be motivated to use the primary and secondary forces of Ohta because she would never add the reinforcing fibers of Ohta to the porous metallic medium of Takahar. Ohta was combined with Takahar solely to supply one of the missing elements of claim 1, i.e., applying pressure to a first portion of a medium precursor and separately applying pressure to a second portion of the medium precursor. This is an improper combination of references based solely in hindsight on claim 1 of the application.

Claims 1 and 14-16 are patentable over Takahar and Ohta not only because the combination of references is improper but also because each claim defines an invention which is patentable over the combination. For example, independent claim 1 defines a method of forming a porous medium wherein the first portion and the second portion of a medium precursor are pressed along a common axis. Neither Takahar or Ohta disclose this feature.

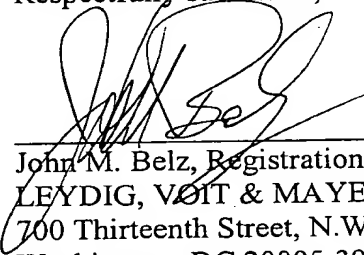
Takahar fails to disclose any aspect of applying pressure to a first portion and a second portion of a medium precursor, as noted in the Office Action. Ohta teaches applying a primary pressing force and a secondary pressing force to a molding material. However, Ohta fails to teach that these pressing forces are applied along a common axis. In fact Ohta teaches directly away from this feature. According to Ohta, the primary

In re Appln. of Charles LOVE  
Application No. 09/793,597

pressing force and the secondary pressing force must be perpendicular to each other in order to properly align the reinforcing fibers, which is the principal object of Ohta. One of ordinary skill in the art reading Takahar and Ohta would find no disclosure or suggestion for pressing first and second portions of a medium precursor along a common axis, as set forth in independent claim 1. Consequently, claims 1 and 14-16 are patentable over Takahar in view of Ohta.

New claims 17-20 are patentable because they depend from patentable claim 1. New claims 21-31 are patentable, for example, for one or more of the reasons previously discussed. For example, independent claim 21 defines a method which includes moving first and second dies along a common axis. Similarly, independent claim 28 defines a method which includes displacing a first die and displacing a second die along a common axis. Both of these claims, as well as dependent claims 22-27 and 29-31, are thus patentable over the combination of Takahar and Ohta for the same reason claim 1 is patentable.

Respectfully submitted,

  
John M. Belz, Registration No. 30, 359  
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Washington, DC 20005-3960  
(202) 737-6770 (telephone)  
(202) 737-6776 (facsimile)

Date: 1 April 2005  
JMB:ves

CERTIFICATE OF MAILING

I hereby certify that this Amendment (along with any documents referred to as being attached or enclosed) is being deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450; Alexandria, VA 22313-1450.

Date: 1 April 2005

LAW OFFICES  
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**FACSIMILE COVER SHEET**

DATE: AUGUST <sup>10</sup>~~7~~, 2005

NUMBER OF PAGES (INCLUDING  
THIS TRANSMITTAL COVER SHEET): 10

YOUR REFERENCE: USAN <sup>09/763,597</sup>~~09/793,597~~

OUR REFERENCE: 440431


FROM: JOHN M. BELZ REG. NO. 30359

TO: EXAMINER K. MENON  
ART UNIT 1723

FAX: 571 272 8300

MESSAGE: Examiner Menon,

I spoke to Examiner Walker while you were on vacation. She asked me to fax you a copy of the response that we filed in response to your October 1, 2004, Office Action. The response was mailed on April 1, 2005, with the appropriate mailing certificate.

  
John M. Belz  
Reg. No. 30,359

A confirmation copy of the transmitted document will:

- ☒ Not be sent. This will be the only form of delivery of the transmitted document.
- ☐ Be sent via First Class/Air Mail.
- ☐ Be sent via Overnight Courier

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In re Application of: Charles LOVE  
 Application No. 09/793,597 09/763,597  
 Filed: July 2, 2001  
 For: METHODS OF FORMING POROUS MEDIA

U.S. Patent and Trademark Office  
 Randolph Building  
 401 Dulany Street, Customer Window, Mail Stop Amendment  
 Alexandria, VA 22314

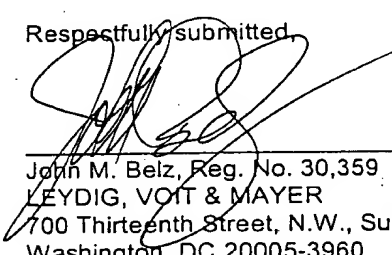
Sir:

- ☐ Small entity status is claimed for this application under 37 CFR 1.27.
- ☒ Petition for an extension of time for the period noted below, as well as for any additional period necessary to render the present submission timely. Please charge Deposit Account No. 12-1216 for the appropriate petition fee.
- ☐ Other:
- ☒ Please charge Deposit Account No. 12-1216 in the total amount indicated below. A duplicate copy of this transmittal sheet is enclosed herewith.

					SMALL ENTITY	OTHER THAN A SMALL ENTITY			
TIME EXTENSION PETITION FEE			three-month		\$ 0.00	\$1,020.00			
	subtract time extension fee previously paid		none		(\$ 0.00)	(\$ 0.00)			
CLAIM FEE	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	EXTRA CLAIMS PRESENT	RATE	ADDIT. CLAIM FEE	RATE	ADDIT. CLAIM FEE	
TOTAL		MINUS		=0	x 25=	\$	x 50=	\$	
INDEPENDENT		MINUS		=0	x 100=	\$	x 200=	\$	
<input type="checkbox"/>	FIRST PRESENTATION OF MULTIPLE CLAIM				+ 180=	\$	+ 360=	\$	
TOTAL AMOUNT TO BE CHARGED TO DEPOSIT ACCOUNT					TOTAL	\$	TOTAL	\$1,020	

- ☒ The Commissioner is hereby authorized to charge any deficiencies in the following fees associated with this communication or credit any overpayment to Deposit Account No. 12-1216.
- ☒ Any filing fees under 37 CFR 1.16 for the presentation of extra claims.
- ☒ Any patent application processing fees under 37 CFR 1.17.

Respectfully submitted,

  
 John M. Belz, Reg. No. 30,359  
 LEYDIG, VOIT & MAYER  
 700 Thirteenth Street, N.W., Suite 300  
 Washington, DC 20005-3960  
 (202) 737-6770 (telephone)  
 (202) 737-6776 (facsimile)

Date: 1 April 2005  
 JMB:ves



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Charles LOVE

Application No. ~~09/793,597~~ 09/793,597

Art Unit: 1723

Examiner: K. Menon

Filed: July 2, 2001

For: METHODS OF FORMING POROUS  
MEDIA

RESPONSE TO OFFICE ACTION

U.S. Patent and Trademark Office  
Randolph Building  
401 Dulany Street, Customer Window, Mail Stop Amendment  
Alexandria, VA 22314

Dear Sir:

In response to the Office Action dated October 1, 2004, Applicant petitions for a three-month extension of time, submits the requisite fee therefor, and requests that the referenced patent application be amended as shown below.

In re Appln. of Charles LOVE  
Application No. ~~09/793,597~~

09/763,597

*TITLE AMENDMENTS*

Replace the title with:

~~POROUS STRUCTURES AND METHODS AND APPARATUS FOR~~ OF FORMING  
~~POROUS STRUCTURES~~ MEDIA

*SPECIFICATION AMENDMENTS*

Delete the current "Summary of the Invention" section of the application including the text beginning "Summary of the Invention" on page 3 and ending "...having any desired shape." on page 6 and substitute the following replacement section:

*Summary of the Invention*

In accordance with one aspect of the invention, a method of forming a porous medium may comprise applying pressure to a first portion of a medium precursor including inorganic particles and separately applying pressure to a second portion of the medium precursor. The first portion and the second portion of the medium precursor are pressed along a common axis. The method further comprises sinter bonding the inorganic particles together to form a porous medium having a porosity of about 50% or more.

In accordance with another aspect of the invention, a method of forming a porous medium may comprise depositing a medium precursor including inorganic particles into a mold cavity. The method also comprises moving a first die against a first portion of the medium precursor in the mold cavity and moving a second die against a second portion of the medium precursor in the mold cavity. The first and second dies are moved along a common axis. The method further comprises sinter bonding the inorganic particles together to form a porous medium having a porosity of about 50% or more.

In accordance with another aspect of the invention, a method of forming a porous medium may comprise depositing a medium precursor including inorganic particles into a mold cavity. The method also comprises displacing a first die and a second die along a common axis against first and second portions, respectively, of the medium precursor in the mold cavity. The method further comprises terminating the axial displacement of the first and second dies. The medium precursor remains in the mold cavity until after the axial displacement of the first and second dies is terminated. The method further comprises sinter bonding the inorganic particles together to form a porous medium having a porosity of about 50% or more.

Methods according to various aspects of the invention can produce a high-quality filter medium having any desired shape. By separately pressing individual portions of the medium precursor, the compression of each individual portion of the filter medium precursor can be maximized or tailored to predetermined specifications.

09/763,597

*CLAIM AMENDMENTS*

1. (Currently Amended) A method of forming a porous medium comprising:  
applying pressure to a first portion of a medium precursor including inorganic  
particles;

separately applying pressure to a second portion of the medium precursor, wherein  
the first portion and the second portion of the medium precursor are pressed along a  
common axis; and

sinter bonding the inorganic particles together to form a porous medium having a  
porosity of about 50% or more.

Claims 2-13 (Cancelled)

14. (Previously Presented) The method of claim 1 further comprising depositing  
the medium precursor as a slurry into a mold cavity, wherein applying pressure to a first  
portion of the medium precursor includes pressing a first die against a first portion of the  
slurry in the mold cavity, and wherein separately applying pressure to a second portion of  
the medium precursor includes pressing a second die against a second portion of the  
slurry in the mold cavity, the first and second dies respectively imparting predetermined  
characteristics to respective portions of the porous medium.

15. (Previously Presented) The method of claim 14 wherein the first and second  
dies press the first and second portions at the same compression ratio.

16. (Previously Presented) The method of claim 14 wherein the first and second  
dies press the first and second portions to substantially the same particle density.

17. (New) The method of claim 1 wherein pressure is applied to the second  
portion of the medium precursor during the application of pressure to the first portion of  
the medium precursor.

18. (New) The method of claim 17 further comprising terminating the application  
of pressure to the first and second portions of the medium precursor at the same time.

19. (New) The method of claim 1 further comprising terminating the application  
of pressure to the first and second portions of the medium precursor at the same time.

20. (New) The method of claim 1 further comprising depositing the medium precursor in a mold cavity before applying pressure to the first and second portions of the medium precursor, wherein the medium precursor remains in the mold cavity until after the application of pressure to the first and second portions of the medium precursor.

21. (New) A method of forming a porous medium comprising:  
depositing a medium precursor including inorganic particles into a mold cavity;  
moving a first die against a first portion of the medium precursor in the mold cavity and moving a second die against a second portion of the medium precursor in the mold cavity including moving the first and second dies along a common axis; and  
sinter bonding the inorganic particles together to form a porous medium having a porosity of about 50% or more.

22. (New) The method of claim 21 wherein the first and second dies move along the common axis in the same direction.

23. (New) The method of claim 21 wherein the first and second dies move along the common axis in opposite directions.

24. (New) The method of claim 21 wherein the second die moves during movement of the first die.

25. (New) The method of claim 21 wherein the second die moves after movement of the first die.

26. (New) The method of claim 21 wherein the first and second dies stop moving at the same time.

27. (New) The method of claim 21 wherein the medium precursor remains in the mold cavity until after the first and second dies have moved axially.

28. (New) A method of forming a porous medium comprising:  
depositing a medium precursor including inorganic particles into a mold cavity;

displacing a first die and displacing a second die along a common axis against first and second portions, respectively, of the medium precursor in the mold cavity;

terminating the axial displacement of the first and second dies, wherein the medium precursor remains in the mold cavity until after the termination of the axial displacement of the first and second dies; and

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29. (New) The method of claim 28 wherein displacing the first and second dies includes axially displacing the first and second dies in the same direction or in opposite directions.

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09/763,597

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According to the Office Action, Takahar does not teach applying pressure to a first portion and separately applying pressure to a second portion in a molding process, but Ohta does. However, the only reason Ohta teaches applying primary and secondary pressing forces is to properly orient reinforcing fibers, up to 40% volume fraction, in a fiber-reinforced composite material. Yet there are no reinforcing fibers in the open cell metallic material of Takahar. Further, one of ordinary skill in the art could not include the reinforcing fibers of Ohta in the fine pore, high porosity, porous metallic material of Takahar because the reinforcing fibers would increase the size of the pores and disrupt the distribution of the micropores, contrary to the stated object of Takahar.

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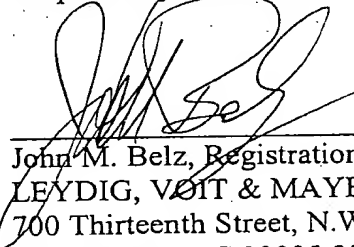
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(202) 737-6776 (facsimile)

Date: 1 April 2005  
JMB:ves

CERTIFICATE OF MAILING

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Date: 1 April 2005



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002	OK	2	15712731143--	010/010	00:02:48

-LEYDIG VOIT AND MAYER -

\*\*\*\*\* - 202 737 6776- \*\*\*\*\*

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 WASHINGTON, D.C. 20005-3960

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**FACSIMILE COVER SHEET**

DATE: AUGUST <sup>10</sup>~~2~~, 2005  
 YOUR REFERENCE: USAN 09/763,597  
 NUMBER OF PAGES (INCLUDING THIS TRANSMITTAL COVER SHEET): 10  
 OUR REFERENCE: 440431

FROM: JOHN M. BELZ REG. NO. 30359

TO: EXAMINER K. MENON  
 ART UNIT 1723  
 FAX: 571 272 8300

MESSAGE: Examiner Menon,

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